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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,663

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Simon Carlile

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EXAMINER

ENSEY, BRIAN

ART UNIT

PAPER NUMBER

2614

MAIL DATE

DELIVERY MODE

03/10/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,663	Applicant(s) CARLILE ET AL.	
	Examiner BRIAN ENSEY	Art Unit 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-32 is/are allowed.
- 6) ☒ Claim(s) 1,2,7,8,10,11,15 and 16 is/are rejected.
- 7) ☒ Claim(s) 3-6,9,12-14,17-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 2, 10, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Allegro et al. U.S. Patent Publication 2004/0175010.

Regarding claim 1, Allegro discloses a method of enhancing sound heard by a hearing-impaired listener, the method comprising: monitoring the sound in an environment in which the listener is located; and manipulating the frequency of high frequency components of the sound in a high frequency band, with little, if any, distortion to components of the sound in a speech frequency band, to enhance spectral cues to aid the listener in sound externalisation and spatialisation (See Fig. 1 and paragraphs 0016 and abstract).

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Regarding claim 2, Allegro further discloses manipulating the frequency of the high frequency components by a technique selected from the group comprising: compressing the components across a frequency range, shifting the high frequency components to lower frequencies (See Fig. 1 and paragraphs 00016 and abstract) and combinations of the foregoing.

Regarding claim 10, Allegro further discloses when effecting the manipulation of the high frequency components, at least partially preserving a harmonic relationship between the components (See abstract).

Regarding claim 15, Allegro further discloses manipulating the frequency of the high frequency components by signal amplification (See paragraph 0010).

Regarding claim 16, Allegro further discloses applying the signal amplification so as to maintain consistent relative gain across frequency for the high frequency components (See paragraphs 0016 and 0031).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allegro et al. in view of Kates U.S. Patent Publication 2003/0072464.

Regarding claim 7, Allegro discloses a method as claimed. Allegro further discloses disclose manipulating the high frequency components by first transforming a sound signal to the

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frequency domain (See Fig. 2). Allegro does not expressly modifying the frequency domain representation using one of a mapping and a warping technique. However, the use of warping to modify frequency domain spectrum of speech signals is well known in the art as taught by Kates (See abstract). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the well know warping technique as taught by Kates to improve ease of listening and speech intelligibility (See Kates abstract).

Regarding claim 8, Allegro discloses a method as claimed. Allegro does not expressly disclose manipulating the high frequency components in the time-domain using at least one of a time-domain filter bank and a resampling technique to shift and/or compress the high frequency components to lower frequencies. However, manipulating high frequency components in the time-domain using a time-domain filter bank to shift the high frequency components to lower frequencies is well known in the art as taught by Kates (See paragraph 0005). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the well know filtering technique as taught by Kates to improve ease of listening and speech intelligibility.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allegro et al. in view of Killion et al. U.S. Patent No. 5,144,675.

Regarding claim 11, Allegro discloses a method as claimed. Allegro does not expressly disclose manipulating the high frequency components using a logarithmic compression technique. However, the use of logarithmic compression in hearing aids is well known in the art as taught by Killion (See col. 4, lines 33-62). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the well know compression

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technique as taught by Killion to accommodate transients without distortion (See Killion col. 4, lines 3-6).

Allowable Subject Matter

Claims 22-32 are allowed.

The prior art does not fairly suggest a hearing aid comprising a primary signal processor for conventional signal processing and an auxiliary signal processor for enhancing spectral cues to aid the listener in sound externalization and spatialisation.

Claims 3, 5, 6, 9, 12-14 and 17-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 12/8/08 have been fully considered but they are not persuasive.

With respect to the applicant's argument that in the applicant's *method as claimed in claim 1, only the high frequency components of the sound are transposed. In the case of Allegro a continuous compression function is used. Although there is less compression at lower frequencies, lower frequency components of the signal are still transposed. In the present method as claimed, the frequencies in the speech frequency band are left uncompressed and, therefore, are not transposed*, the Examiner respectfully disagrees.

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The Examiner points to the fact that the applicant only claims **components of the sound in a speech frequency band are substantially unchanged**. The applicant defines a “speech frequency band” as “approximately, but not exactly, 200 Hz to 4k Hz” (See disclosure page 2, lines 16-18). Additionally, the applicant claims the frequencies are “substantially unchanged.” The applicant does not claim “the frequencies in the speech frequency band are left uncompressed and, therefore, are not transposed”. Allegro teaches only minor linear compression from 0 to about 2 kHz and non linear compression at the higher frequencies above 2 kHz (See Fig. 2). Therefore, the Examiner submits that the components in the “speech frequency band” as “approximately, but not exactly, 200 Hz to 4k Hz” are “substantially unchanged ” and the high frequency components of the sound in the high frequency band are manipulated. Since the applicant relates all the rejection arguments to claim 1, the Examiner maintains the rejection of all indicated claims at least for the reasons disclosed above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN ENSEY whose telephone number is (571)272-7496. The examiner can normally be reached on Monday - Friday 6:00 AM - 2:30 PM.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
P.O. Box 1450
Alexandria, Va. 22313-1450

Or faxed to:

(571) 273-8300, for formal communications intended for entry and for informal or draft communications, please label "PROPOSED" or "DRAFT".

Hand-delivered responses should be brought to:

Customer Service Window
Randolph Building
401 Dulany Street
Arlington, VA 22314

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 571-272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian Ensey/
Primary Examiner, Art Unit 2614
March 5, 2009